SAE Government and Industry Meeting

Monitoring the Real World Crash Performance Of Vehicles Equipped With Advanced Air Bag Features

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Research and Development

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NHTSA
People Saving Peo
http://www.nhtsa.dot.

Objectives of the Frontal Air Bag Data Collection Program

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- Examine safety impact of rapidly changing technology in airbags.
- Provide early detection of alleged or potential vehicle defects.

NASS

SPECIAL CRASH INVESTIGATIONS
SCI
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

Frontal Air Bag Data Collection Programs

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- NCSA currently collects and distributes real world crash data in two major vehicle crash programs:
  - NASS-CDS – A national statistically sampled data base, currently collecting data on about 4,000 crashes each year at 24 locations around the U.S.;
  - SCI – Collects approximately 200 crash investigations annually of vehicles equipped with emerging technology in occupant protection.

Objectives of the Frontal Air Bag Data Collection Program

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- Data Collection for 2002
  - New Variables and Attributes
  - Special Crash Investigations 100/year
  - Alliance commitment to Congress

Alliance Commitment

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Blue Ribbon Panel

- Recommended:
  - **Collecting data on late model vehicles equipped with advanced or redesigned occupant protectio features involved in frontal crashes in 3 NASS PSU Locations**
- www.highwaysafety.org/presentations/brp

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Alliance Commitment

- Data Collection (36 months)
  - (April 1, 2002 to March 31, 2005)
- All researchers actively selecting cases
- 450 cases expected each year
- 1350 cases for the study

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Objectives of the Frontal Air Bag Data Collection Program

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- Data Distribution for 2002
  - Preliminary NASS cases viewing available via the WWW (Summer 2002)
    - **Updated filter system**
  - Public access to Special Crash Investigations cases via the WWW (Summer 2002)

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Frontal Air Bag Categories for Data Collection Program

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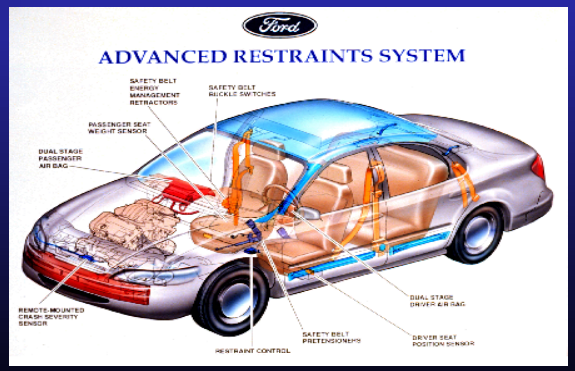
- **Sled Certified –**
  - Redesigned (a.k.a. Depowered)
  - Advanced Features – Multi-stage inflators, etc
- **Advanced Certified –**
  - As certified advanced air bags come into the market (required in MY 04)



Advanced Occupant Protection System Study (AOPSS)

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- The objective of the Advanced Occupant Protection System Study (AOPSS) is to provide data that will assess the "real world" performance of vehicles equipped with advanced occupant protection system features in frontal crashes.
- The goal is to determine if they offer a greater measure of ***safety for children and out of position occupants while offering improved protection to adults in crashes of high severity***

Advanced Occupant Protection System Study (AOPSS)

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Research Priorities:

- Air bag related injuries
- Out-of-position occupants
- Small statured adults
- Children
- Higher speed crashes (belted and unbelted)
- Unusual circumstances
  - with early identification of potential problems.

Minimum Criteria for AOPSS Selection

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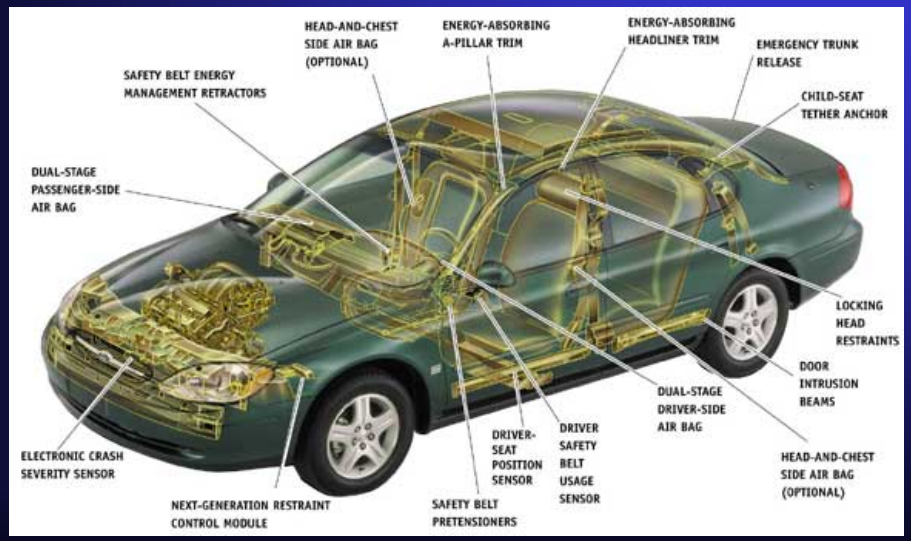
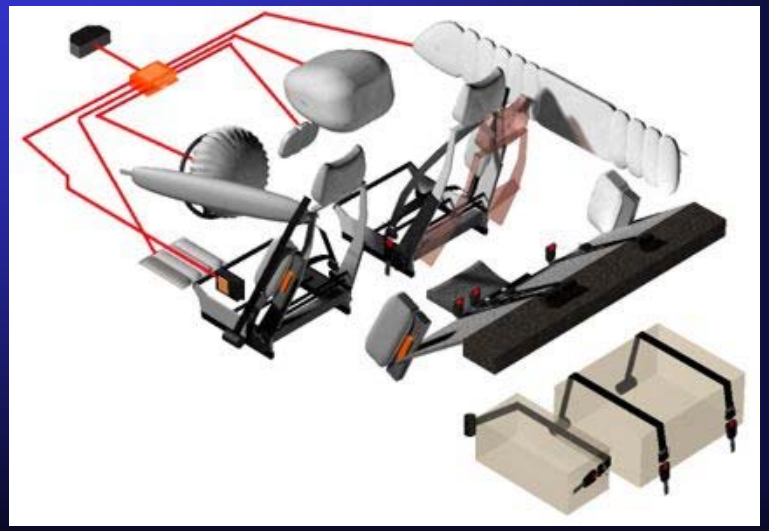
- 2000 model year vehicle or newer involved in a fronta crash with a police reported crash configuration of 1 12 or 01 o'clock, equipped with any advanced occupant protection system feature, and towed due t damage





Minimum Criteria for AOPSS Selection

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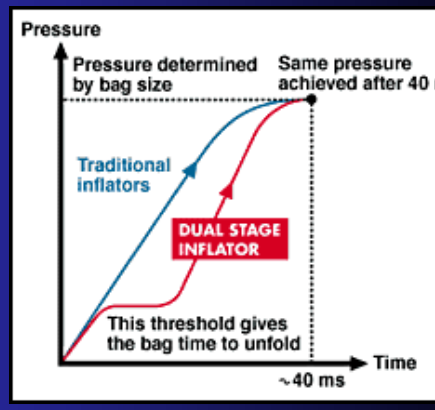
- Vehicles may include one or more of the following features:
  - **Multi-stage inflators,**
  - **Occupant sensors**
    - Spatial: sonic/infrared
    - Bladder: weight sensors/load cells,etc.
  - **Seat track sensors**
  - **Systems that may provide automatic air bag suppression.**



ther AOPSS Activities
oordination with Industry

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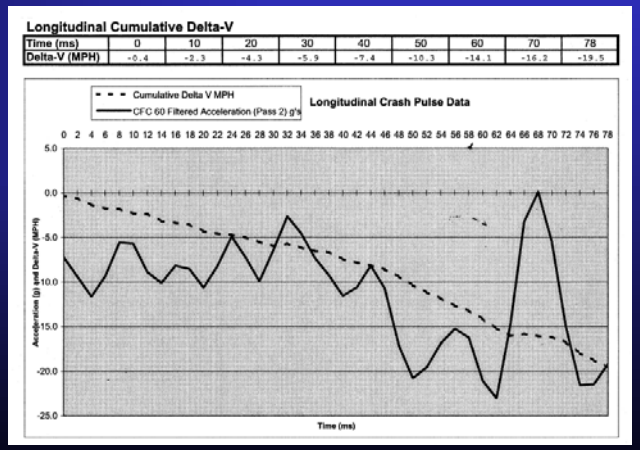
- Working with Crash Investigators, Engineers and Designers
  - **Case-by-Case Evaluation on**
    - Real World Performance of the Advanced Occupant Protection System Technologies
    - EDR Readouts



What We Have Learned: EDR Data Collection

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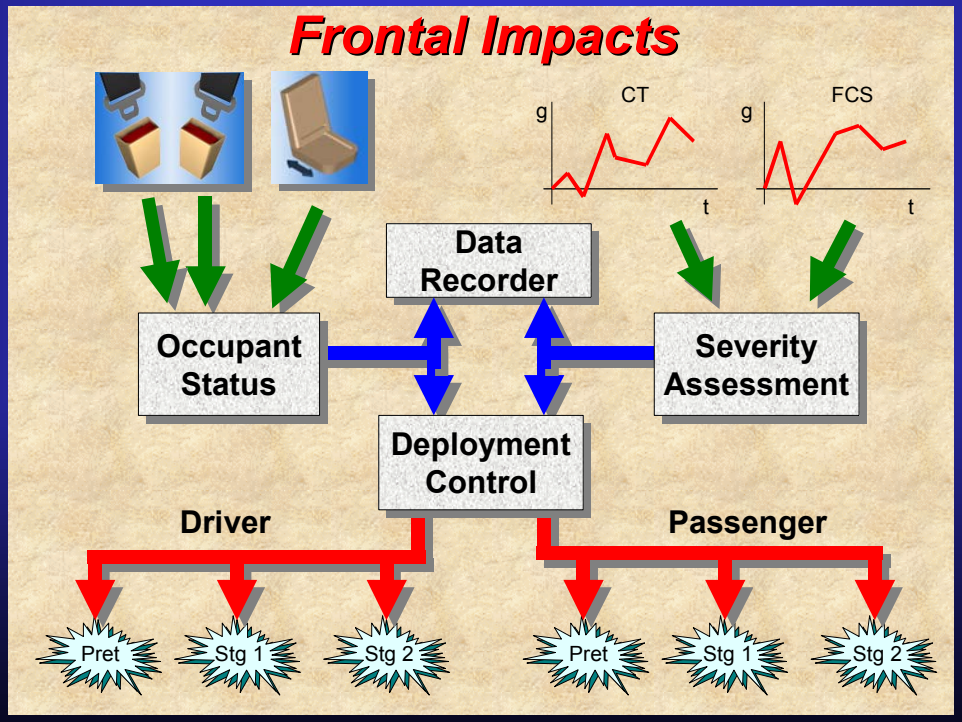
- The most effective method to observe and/or measure the performance of **Advanced Occupant Protection System Features** is through the EDR data



What We Have Learned: EDR Data Collection

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- Our NASS researchers required more training in using CDR tool.
  - All NASS investigators were given additional training in November 2001.
- Only one CDR tool per site
  - In 2002, a CDR Tool was purchased for each NASS Researcher.

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What We Have Learned:
EDR Data Collection

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- Enhancement of the crash reconstruction.
  - Crash pulse, time to deployment, restraint usage, etc
- Improvement in data quality.
  - Used for validation of data.
  - Improves data completion.

rol Module Data

y Check:	Valid	EDR Model Version:	141

Side Bag Deployment Time (ms):	Not Deployed
enger) Side Bag Deployment Time (ms):	Not Deployed
Airbag Switch Position During Event:	N/A
Codes Active When Event Occurred:	0

Times Actual initiation depends on restraint system status (below).

	ms
Algorithm Wakeup to Pretensioner:	8
Algorithm Wakeup to First Stage - Unbelted:	10
Algorithm Wakeup to First Stage - Belted:	21
Algorithm Wakeup to Second Stage:	0

System Status

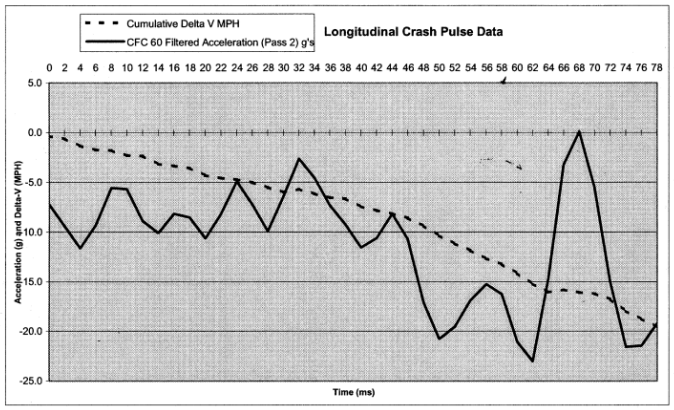
Belt Buckle:	Engaged
Seat Belt Buckle:	Not Engaged
Track In Forward Position:	No
Seat Weight Switch Position:	N/A

nt Initiation Attempt Times

	Driver	Passenger
Algorithm Wakeup to Pretensioner Deployment Attempt:	8	Unbelted
Algorithm Wakeup to First Stage Deployment Attempt:	21	21
Algorithm Wakeup to Second Stage Deployment Attempt:	Disposal	Disposal

Longitudinal Cumulative Delta-V

Time (ms)	0	10	20	30	40	50	60	70	78
Delta-V (MPH)	-0.4	-2.3	-4.3	-5.9	-7.4	-10.3	-14.1	-16.2	-19.5



What We Have Learned: EDR Data Collection

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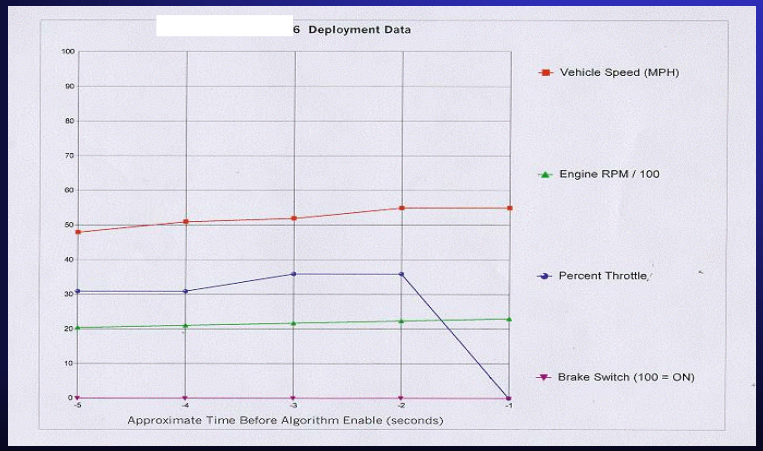
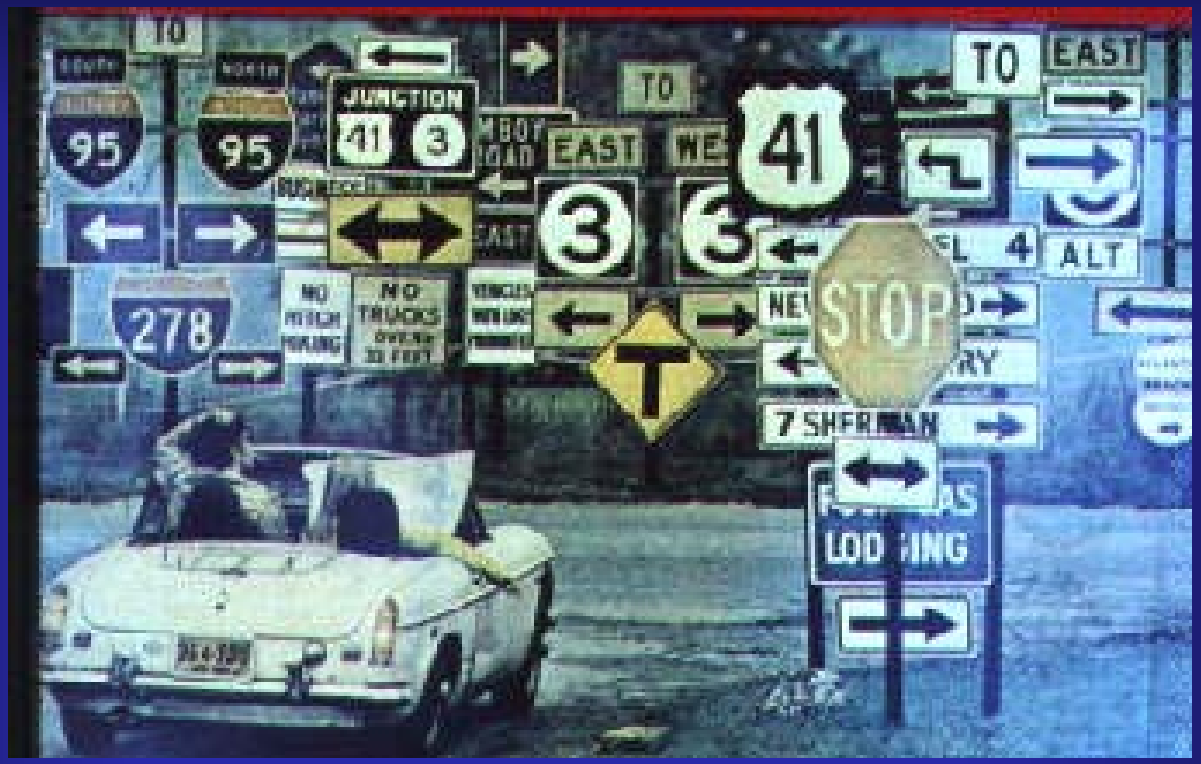
- We can only read a limited number of vehicles
  - Vetronix CDR tool for GM
  - NHTSA is involved with a beta test to read 2000 Ford Taurus/Sable.
  - We need more manufacturers involvement

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Questions?